the advantages enjoyed by cable operators so great as to render them dominant in the provision of mass-market broadband services?

C. SBC Could Not Leverage Market Power from Telephone Exchange or Exchange Access Services into the Mass-Market Broadband Services Market

84. We have demonstrated above that SBC does not now have market power in the advanced services market. The final component of the FCC's non-dominance framework is to address whether SBC could nevertheless quickly acquire market power in the broadband Internet access market by leveraging any market power it might have in the provision of telephone exchange or exchange access services. For purposes of this analysis, the Commission has held that the issue is not whether SBC might enjoy certain advantages in the broadband market by virtue of its position in the local exchange market. The issue is not even whether SBC might confer advantages on its broadband operations through discrimination and cross-subsidization. Rather, the issue is whether SBC could leverage market power in the local exchange market to the point that it *quickly* acquired market power in the mass-market broadband services market. As the FCC explained in the *BOC Classification Order*:

> improper allocation of costs by a BOC is of concern because such action may allow a BOC to recover costs from subscribers to its regulated services that were incurred by its interLATA affiliate in providing competitive interLATA services. In addition to the direct harm to regulated ratepayers, this practice can distort price signals in those markets and may, under certain circumstances, give the affiliate an unfair advantage over its competitors . . . For purposes of determining whether the BOC interLATA affiliates should be classified as dominant, however, we must consider only whether the BOCs could improperly allocate costs to such an extent that it would give the BOC interLATA affiliates, upon entry or soon thereafter, the ability to raise prices by restricting their own output.[113]

The Commission's conclusion that dominant carrier regulation of a service is appropriate only if the BOC could quickly acquire market power in that service is sound. As the Commission noted,

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113. *BOC Classification Order*, *supra* note 11, at 15,815 ¶ 103.

"our dominant carrier regulations are generally designed to prevent a carrier from raising prices by restricting its output[.] . . . We agree with DOJ that applying dominant carrier regulation to an affiliate in a downstream market would be 'at best a clumsy tool for controlling vertical leveraging of market power by the parent, if the parent can be directly regulated instead.'"[114] Moreover, as the Commission noted, "regulations associated with dominant carrier classification can . . . have undesirable effects on competition."[115] Thus the Commission does not impose dominant carrier status on an entity or service unless the firm at issue can control price in the market by restricting its output of that service. The FCC does not impose dominant carrier status simply to ensure what some call "a level playing field."

85. It is inconceivable that any showing of leveraging could be made. As noted above, cable operators enjoy significant advantages in the broadband Internet access market. To quickly acquire market power, SBC would not only have to overcome these advantages, but also would have to establish its own overwhelming advantages. Considering that the services in which SBC is ostensibly dominant—local exchange and exchange access services—are highly regulated, that outcome is most unlikely.

86. Of course, the FCC need not speculate on this point. If, soon after entering the mass-market broadband services market, SBC could have acquired monopoly power in that market, it presumably would have done so. Yet SBC's market share continues to be dwarfed by its cable competitors, and those competitors are signing up two of every three new customers. Those facts show that SBC cannot use its position in the local exchange market to obtain dominance in the mass-market broadband services market.

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114. *Id.* at 15,804 ¶ 85, 15,808 ¶ 91 (quoting DOJ Aug. 30, 1996 Reply at 27).
115. *Id.* at 15,808 ¶ 90.

87. In any event, SBC could not, even as a theoretical matter, quickly acquire market power in the mass-market broadband services market by leveraging any market power that it might retain in the local exchange market. In its past orders, the Commission has recognized three ways in which such leveraging could occur: cross-subsidization, discrimination, and the effectuation of a price squeeze. We address each below in the context of the relevant product market.

88. In the *BOC Classification Order*, the Commission held that BOC long-distance affiliates could obtain the ability, through cross-subsidization, to raise prices by restricting their own output only "if a BOC's improper allocation enabled a BOC interLATA affiliate to set retail interLATA prices at predatory levels (*i.e.*, below the costs incurred to provide those services), drive out its interLATA competitors, and then raise and sustain retail interLATA prices significantly above competitive levels."[116] Thus the issue here is whether, through cross-subsidization, a BOC could set DSL prices at predatory levels, drive its broadband competitors out of the market, and then raise and sustain its prices significantly above competitive levels.

89. Even in the unlikely event that SBC could drive a cable operator into bankruptcy, the bandwidth capacity of that carrier would remain intact, ready for another firm to use (after a liquidation sale) and immediately undercut SBC's noncompetitive prices. If SBC were to attempt predatory pricing in the broadband market, it could not expect to recoup its investment in sales made below incremental cost. The FCC has expressly embraced this economic reasoning when it concluded that predation is implausible with respect to either long-distance fiber-optic

116. *Id.* at 15,815 ¶ 103.

networks[117] or spectrum.[118] The argument applies with equal force to the fixed broadband infrastructure of a cable operator.

90. Clearly such cross-subsidization is not possible. SBC has, until quite recently, been treated as a non-dominant provider of DSL services, and its prices for DSL Internet access services—far from being predatory—are *higher* than prevailing prices for cable modem service, as are its costs.[119] Moreover, SBC could not possibly finance a predatory pricing strategy through cross-subsidization. SBC's basic local exchange rates are subject to rigorous price regulation, including price ceilings, in each of its states. Thus, SBC has no ability to raise basic local exchange prices to finance below-cost DSL prices. Similarly, SBC's switched-access prices are capped, as a result of the *CALLS* proceeding, at 0.55 cents per minute and its special-access rates are constrained by price cap regulation in all areas that do not exhibit sufficient competition to qualify for pricing flexibility.[120] Given these regulatory requirements, SBC has no ability to finance below-cost DSL prices with price increases in telephone exchange or exchange access services.

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117. *See* Implementation of the Non-Accounting Safeguards of Sections 271 and 272 of the Communications Act of 1934, as Amended; and Regulatory Treatment of LEC Provision of Interexchange Services Originating in the LEC's Local Exchange Area, Notice of Proposed Rulemaking, CC Dkt. No. 96-149, 11 F.C.C. Rcd. 18,877, 18,943 ¶ 137 (1996) (citing Daniel F. Spulber, *Deregulating Telecommunications*, 12 YALE J. ON REG. 25, 60 (1995)). *See also* J. GREGORY SIDAK & DANIEL F. SPULBER, DEREGULATORY TAKINGS AND THE REGULATORY CONTRACT: THE COMPETITIVE TRANSFORMATION OF NETWORK INDUSTRIES IN THE UNITED STATES 93-94 (Cambridge Univ. Press 1997) (making same argument).

118. *See* Applications of Voicestream Wireless Corp., Powertel, Inc., Transferors, and Deutsche Telekom AG, Transferee, for Consent to Transfer Control of Licenses and Authorizations Pursuant to Sections 214 and 310(d) of the Communications Act and Petition for Declaratory Ruling Pursuant to Section 310 of the Communications Act and Powertel, Inc., Transferor, and Voicestream Wireless Corp., Transferee, for Consent to Transfer Control of Licenses and Authorizations Pursuant to Sections 214 and 310(d) of the Communications Act, etc., Memorandum Opinion and Order, IB Dkt. No. 00-187, 16 F.C.C. Rcd. 9779, ¶ 90 (released Apr. 27, 2001).

119. Those higher prices are a product both of the higher costs of DSL deployment and the Commission's asymmetric regulatory requirements, which further raise SBC's cost of providing DSL service.

120. Access Charge Reform; Price Cap Performance Review for Local Exchange Carriers; Low-Volume Long Distance Users; Federal-State Joint Board on Universal Service, CC Dkt. No. 96-262 et al., 15 F.C.C. Rcd. 12,962, 13,029 ¶ 162 (2000).

91. In the *BOC Classification Order,* the Commission expressed concern that a BOC could "discriminate against unaffiliated interLATA carriers, such as through poorer quality interconnection arrangements or unnecessary delays in satisfying its competitors' requests to connect to the BOC's network."[121] The Commission nevertheless concluded that a BOC could not discriminate "to such an extent that [its] affiliate would gain the ability to raise prices by restricting its own output upon entry or shortly thereafter."[122]

92. In this case, similar concerns about discrimination are misplaced. Unlike the long-distance market in 1996, the broadband Internet access market is characterized by significant intermodal competition. Cable companies and wireless providers, in particular, are in no way dependent upon SBC services or facilities in their provision of broadband Internet access. Thus SBC has no ability to discriminate against these entities. For that reason alone, it could not possibly acquire market power through discrimination.

93. In the *BOC Classification Order*, the Commission held that "the entry of a BOC's affiliate into the provision of in-region, interstate, domestic, interLATA services might give the BOC an incentive to raise its price for access services to disadvantage its affiliate's rivals, increase its affiliate's market share, and increase the profits of the BOC overall."[123] It concluded nonetheless that "price cap regulation of the BOCs access service sufficiently constrains a BOC's ability to raise access prices to such an extent that the BOC affiliate would gain, upon entry or soon thereafter, the ability to raise prices of interLATA services above competitive levels by restricting its own output of those services."[124]

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121. *BOC Classification Order, supra* note 11, at 15,821-22 ¶ 111.
122. *Id.*
123. *Id.* at 15,829 ¶ 125.
124. *Id.* at 15,829-30 ¶¶ 125-26.

94. As with discrimination, the price squeeze concerns addressed in the *BOC Classification Order* are inapt in the present context. Because SBC's largest competitors in the broadband Internet access market do not rely on BOC facilities, the BOCs could not possibly acquire market power in that market by raising the costs of its rivals. Moreover, those competitors who do rely on BOC facilities—DLECs who purchase unbundled loops—are able to lease those facilities at TELRIC rates, not allegedly inflated access rates. Thus, there is no basis upon which the Commission could conclude that the BOCs could acquire market power in their provision of broadband Internet access services by effecting a price squeeze.

III. SBC Is Non-Dominant in the Larger-Business Advanced Services Market

95. Larger-business advanced services are provided by the big three IXCs, the RBOCs, and other providers to medium-sized and larger firms that require high-speed connections between multiple premises—for example, from one local area network (LAN) to others. In the following sections, we elaborate on the relevant product and geographic markets. We then apply the FCC's four-part non-dominance test to determine whether SBC has market power in the larger-business advanced services market.

A. Larger-Business Advanced Services Constitute a Relevant Product Market

1. The Product Market

96. The two primary services in this packet-switched submarket are frame relay service and asynchronous transfer mode (ATM) service.[125] Frame relay service is a packet-based transport protocol developed primarily for the efficient transport of unpredictable or "bursty"

125. There are presumably other technologies that could be included in the market. For example, older packet-switching services, such as Switched Multimegabit Data Service (SMDS), and new services, such as Gigabit Ethernet, are potential substitutes for ATM and frame relay.

data associated with LAN-to-LAN communications.[126] By comparison, ATM is a connection-oriented service, which is used either as a transport medium or as a backbone supporting other transport protocols such as frame relay.[127] Whereas frame relay carries almost exclusively data traffic, ATM also supports integrated voice and video traffic.[128]

97. Our market definition analysis proceeds in an identical fashion as our previous analysis of mass-market broadband services. We apply the same criteria to assess whether advanced services to larger businesses constitutes a relevant product market. First, the services in this market appear to serve the same function from the customer's viewpoint—that is, transmitting data between computers and between networks of computers. In addition, ATM and frame relay are used to provide connections between LANs and the Internet.[129] Moreover, ATM and frame relay services are used predominantly for high-speed applications. For example, more than three-quarters of all frame relay revenues are derived from services provided at fractional DS-1 speeds (typically between 400 and 800 Kbps) or above, and more than 60 percent are derived from services provided at speeds between DS-1 (1.5 Mbps) and DS-3 (44 Mbps).[130] ATM service is provided at speeds of between 1.5 Mbps and 10 Gbps, but nearly two-thirds of ATM revenues are derived from services provided at speeds between DS-1 and DS-3.[131]

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126. IDC, U.S. FRAME RELAY SERVICES: MARKET FORECAST AND ANALYSIS, 2000-2005, at 3 (2001) [hereinafter IDC FRAME RELAY STUDY].

127. IDC, ATM SERVICES MARKET SHARE AND ASSESSMENT, 2000-2005, at 3 (2001) [hereinafter IDC ATM STUDY].

128. *Id.*

129. *See, e.g.*, Mulitmedia Telecommunications Association, Investext Rpt. No. 7044818, Telecom-Market Review and Forecast '98 – Industry Report, Jan. 1, 1998, at *10 ("LAN interconnection and access to the Internet are now nearly universal in the business marketplace. The focus has shifted to providing high-speed transmission for large volumes of data. Frame relay, ATM, T1/T3, ISDN, SMDS, Gigabit Ethernet, and fast modems are among the equipment and technologies enhancing the needs of local area network users.").

130. IDC FRAME RELAY, *supra* note 126, at Table 3.

131. IDC ATM STUDY, *supra* note 127, at Table 3.

98. Second, larger-business customers view the services within this market as substitutes for each other. Several analysts have observed significant migration between frame relay and ATM services.[132] IDC describes the explicit connection between frame relay and ATM networks:

> As frame relay networks grow, corporations require ever more bandwidth at their hub sites. With service interworking, customers can build hybrid backbone networks, upgrading corporate data centers with higher-speed ATM connections while retaining T1 frame relay connections at the branch office sites.[133]

Indeed, frame-relay-to-ATM internetworking is a primary contributor to the growth of ATM revenue.[134]

99. Third, advanced-services providers view the services within this market as substitutes for one other. Service providers likewise view the services in this market as interchangeable with one another. For example, AT&T, [135] WorldCom,[136] Sprint,[137] and other

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132. STRATECAST PARTNERS, ATM AND FRAME RELAY MARKET ASSESSMENT, DATA/INTERNET SERVICES GROWTH STRATEGIES, Sept. 2001, at 16 ("ATM's biggest appeal will continue to at the high-end of the market, where companies can cost justify the use of the technology for their application requirements. At the low-end of the market, the technology will continue to be challenged by frame relay."); Multimedia Telecommunications Association, Industry Report, Telecom-Market Review & Forecast '98-Lan-Wan Netwk Mkt., Jan. 1, 1998, at *19 ("Current users of ATM fall into four general categories: ISPs; government, medical, and educational institutions; companies with heavy LAN interconnect requirements; and frame relay users with the need to connect high-capacity sites.").

133. IDC ATM STUDY, *supra* note 127, at 7.

134. *Id.* at Figure 1.

135. J. Jones, *AT&T Readies Outsourced E-mail, Network Services*, INFOWORLD DAILY NEWS, Jan. 24, 2000 (AT&T states that its Managed ATM service is "aimed at enterprises migrating out of total reliance on frame-relay networks to newer technologies such as ATM or frame relay-to-ATM service interworking."); AT&T Corp., Data and IP Services, Products and Services, ATM http://www.ipservices.att.com/brochures/atm.pdf (AT&T's High Speed Packet Network . . . enables you to migrate your network smoothly and gradually, on a location by location basis, from frame relay to ATM.")

136. MCI WorldCom, Inc., Products and Services, ATM, http://www.worldcom.com/us/products/datanetworking/atm/index.phtml.) (WorldCom's Frame Relay to ATM Service Interworking (FRASI) "provides a pathway of migration for today's frame relay networks to the comprehensive networking capabilities of ATM.").

137. *See* Sprint Corp., Sprint Business, Products and Solutions, Data, ATM, ATM and Frame Relay Technical Report, http://www.sprintbiz.com/business/resources/resource/SPR6859c.pdf ("Once your data or multimedia applications outgrow frame relay's bandwidth limitations, Sprint can assist you in developing a gradual migration path to ATM.")

carriers[138] all advertise ATM service as a replacement for Frame Relay service. Various service providers also have recognized that new services like Gigabit Ethernet may well "cannibalize" existing services like Frame Relay and ATM.[139] Several carriers have recognized significant substitution between the various packet-switching services that they offer. For example, WorldCom has stated that "when we introduce IP VPNs we are going to cannibalize some of our frame relay business."[140]

100. Fourth, the services within this market are generally priced in a similar manner. For example, AT&T charges $3,130 per month for frame relay service at 1.536 Mbps,[141] and charges the identical amount for ATM ports at 1.536 Mbps.[142] For comparison purposes, AT&T charges $7,515 per month per ATM port at 9.264 Mbps.[143] Under SBC's tariff, a DS-3 link and port for Frame Relay service in SBC's central region costs $4,435 per month (under a one-year contract) plus a $3,030 non-recurring charge.[144] By comparison, a DS-3 link and port for ATM service in SBC's central region costs $3,950 per month (under a one-year contract) plus a $3,000 non-recurring charge.[145]

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138. *See, e.g.*, Adelphia Business Solutions, Products, Frame Relay http://www.adelphia-abs.com/html/products/frdatasheet.pdf ("Frame relay can reduce your company's operating costs, while improving your network performance and simplifying network management. Plus, it can help companies prepare for future network growth by providing a migration path to Asynchronous Transfer Mode (ATM) technology."); *Equant First Global Carrier to Integrate Voice and Data Over ATM, IP and Frame Relay*, GLOBAL NEWS WIRE, Apr. 22, 2000 ("Employ Equant's new frame relay-to-ATM enhancement to seamlessly migrate from frame relay to ATM at speeds from 2Mbps and above, without having to install costly equipment to facilitate the conversion.").

139. *See, e.g., Putting romance back in the data business; Company Business and Marketing*, COMM. WK. INT'L., Feb. 5, 2001, at 1 (quoting of Ron Beaumont, COO, of WorldCom saying: "When we introduce IP VPNs we are going to cannibalize some of our frame relay business.").

140. *Id.*

141. IDC FRAME RELAY STUDY, *supra* note 126, at Table 26.

142. IDC ATM STUDY, *supra* note 127, at Table 21.

143. *Id.*

144. SBC Advanced Solutions Inc., Advanced Services Tariff, Tariff F.C.C. No. 1 § 5.4 (Sept. 10, 2001).

145. *Id.* § 4.4.

101. In summary, packet-switched services serve the same function, are considered substitutes from the perspective of both users and producers, and are priced in a similar fashion. Hence, it is reasonable to treat those services as part of the same relevant product market.

102. We recognize that there might be other services that, for some customers, are substitutes for packet-switched services. In particular, for some subset of large-business customers, dedicated or private line connections might be economically attractive alternatives. But for most customers, a dedicated connection is a viable alternative only if they can generate sufficient traffic to justify a dedicated facility. Moreover, dedicated facilities are not economically viable for a business that wishes to connect multiple locations.[146] For these reasons, we treat packet-switching services as a discrete market. Even if our focus might be too narrow, the inclusion of additional services, such as dedicated connections or mass-market broadband connections, only strengthens our conclusion of non-dominance because it increases supply substitutability from other services and other providers.[147]

2. The Geographic Market

103. Business customers use packet-switching services to transmit information between at least two specified end points—for example, between two distant customer locations, or between a single customer location and the Internet. As described above, under the Commission's framework for defining geographic markets, each point-to-point market constitutes a distinct geographic market. The Commission has held, however, that, because it is both impractical and ultimately futile to analyze market power for each individual point-to-

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146. In a frame network design, a "frame relay access from each site is provided into the network cloud, requiring only a single connection point . . . Connections from a single site to any of the other sites can be easily accommodated using the pre-defined network connections of the virtual circuits." *See* REGIS J. BATES & DONALD GREGORY, VOICE AND DATA COMMUNICATIONS HANDBOOK 622 (McGraw Hill 1998).

147. *See* Landes & Posner, *supra* note 10, at 944-52.

market, the Commission will "aggregate into a relevant geographic market those customers facing similar choices regarding a particular relevant product or service in the same geographic area."[148]

104. Applying that framework here, the relevant geographic area for analysis is SBC's entire local service territory. From a demand perspective, customers that purchase packet-switching services typically seek to connect multiple points that are often widely dispersed. For example, in 2000, the average frame-relay customer purchased 12.0 ports,[149] and the average ATM customer purchased 5.4 ports.[150] Each switching port typically represents a distinct point that the customer wishes to connect, so that there is often a one-to-one correspondence between switching ports and connection points.[151] These customers look for service providers that are capable of serving large geographic areas.

105. Indeed, many customers seek service providers that are capable of providing packet-switching service not only on an intraLATA basis, but also on an interLATA basis, and in many cases on an international basis. According to IDC, 88 percent of packet-switched revenues are derived from the interLATA provision of such services.[152] Carriers with national and international capabilities accounted for 84.2 percent of ATM revenues in 2000,[153] and 82.3 percent of frame-relay revenues in 2000.[154]

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148. *SBC/Ameritech Order*, *supra* note 1, at 14,746-47 ¶ 69; *see also BOC Classification Order*, *supra* note 11, at 15,792-93 ¶ 64.

149. IDC FRAME RELAY STUDY, *supra* note 126, at Table 1.

150. IDC ATM STUDY, *supra* note 127, at 7.

151. In some cases, however, a customer may use a single switching port to connect to an Internet service provider (or some other entity) that already has an existing switching port on the same ATM or frame-relay network. In those cases, a single switching port may represent up to two distinct connection points.

152. IDC, U.S. PACKET/CELL-BASED SERVICES MARKET FORECAST AND ANALYSIS, 2000-2005, at Tables 6, 10, 20, and 24 (2001) [hereinafter IDC PACKET STUDY]. We assume that all non-local national revenue is interLATA revenue.

153. IDC ATM STUDY, *supra* note 127, at 16.

154. IDC Frame Relay, *supra* note 126, at 15.

106. From a supply perspective, the competitive alternatives do not vary significantly across SBC's region. The three largest providers of packet-switching services to business customers in SBC's region are AT&T, WorldCom, and Sprint. Nationwide, these three carriers account for 68.4 of all frame relay revenues[155] and 65.8 percent of all ATM revenues.[156] Each of these carriers provides packet switching ubiquitously throughout SBC's region. For example, AT&T claims that "[a]s the frame relay market leader, AT&T has the largest frame relay network," which includes "620 domestic Points of Presence (POP) so local access circuit mileage is minimized."[157]

107. Many other competitive carriers provide packet-switching services to business customers throughout SBC's region. For example, in SBC's region there are at least 50 CLECs (not including AT&T, WorldCom, or Sprint) that currently provide one or more packet-switching services to business customers.[158] McLeod provides packet-switching services to business customers in at least 34 major cities in SBC's region.[159] Allegiance provides service in at least 27 SBC cities;[160] Global Crossing[161] and XO[162] each serves at least 18; Pac West serves at least 15;[163] and Time Warner Telecom serves at least 10.[164]

108. For the foregoing reasons, we believe that it is reasonable to consider the relevant geographic market as SBC's entire region.

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155. *Id.* at Figure 5.
156. IDC ATM STUDY, *supra* note 127, at Figure 6.
157. AT&T Corp., High Speed Packet Services, AT&T Frame Relay and ATM Services, (downloaded from AT&T's web site at http://www.ipservices.att.com/brochures/atm.pdf).
158. NEW PARADIGM RESOURCES GROUP, CLEC REPORT 2000 (2001), at Ch. 13 [hereinafter NEW PARADIGM STUDY].
159. *Id.* at 28.
160. *Id.* at 17.
161. *Id.* at 12.
162. *Id.* at 16.
163. *Id.* at 9.
164. *Id.* at 18.

B. Application of the FCC's Four-Part Test to the Larger-Business Advanced Services Market

109. As we demonstrate below, SBC's national and in-region shares of the larger-business advanced services market are extremely small—so small, in fact, that the other three factors in the FCC's dominance test might be entirely superfluous. For the sake of completeness, however, we apply each of the four components of the FCC's test to ATM and frame-relay offerings.

1. Market Share

110. For 2000, AT&T was the national market leader in frame relay, with 35.0 percent of total frame-relay revenue and 30.9 percent of total ports.[165] WorldCom ranked second with 23.3 percent of revenue and 16.6 percent of ports. Sprint ranked third with 10.1 percent of revenue and 7.7 percent of ports; SBC ranked fifth in frame-relay revenue and seventh in total ports, with 4.4 percent of total frame-relay revenue and 7.1 percent of total ports.[166] Because SBC is constrained through regulation and section 271 of the Telecommunications Act[167] within its region to operate within the LATA boundaries there, SBC's nationwide share understates its in-region share. To estimate SBC's in-region share, we aggregate the national share for each of the four RBOCs and assume that each RBOC has the same in-region market share. Summing the national shares across Verizon (4.2 percent), SBC (4.4 percent), BellSouth (3.6 percent), and U S WEST[168] (3.0 percent) yields an in-region RBOC estimate of 15.2 percent.[169] Thus, we believe that one reasonable estimate of SBC's in-region market share for frame relay is 15.2 percent.

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165. IDC FRAME RELAY STUDY, *supra* note 126, at 12-13.
166. *Id.*
167. 47 U.S.C. § 271.
168. IDC FRAME RELAY STUDY, *supra* note 126, at 12-13. IDC presents separate estimates for Qwest and U S WEST shares.
169. *Id.* at 35.

When we account for SBC's share of all business access lines, our estimate of SBC's share of in-region frame-relay revenues falls to 11.1 percent.[170] Even recognizing that this is just an estimate, SBC's market share is clearly well below the level necessary for market power.

111. AT&T, Sprint, and WorldCom also dominate the provision of ATM services. According to IDC, AT&T had a 23.2 percent share of ATM revenue for 2000;[171] Sprint ranked second with 21.7 percent;[172] WorldCom ranked third with 20.9 percent.[173] Of the local providers, SBC ranked highest in total revenue-based market share with 6.5 percent,[174] followed by Verizon with 4.4 percent.[175] To estimate SBC's in-region share of ATM revenues, we again aggregate the national share for each of the RBOCs. Summing the national shares across Verizon (4.4 percent), SBC (6.5 percent), BellSouth (1.4 percent), and U S WEST[176] (1.7 percent) yields an in-region RBOC estimate of 14.0 percent. Thus, we believe that one reasonable estimate of SBC's in-region market share for ATM is 14.0 percent. When we account for SBC's share of all business lines, our estimate of SBC's share of in-region ATM revenues rises to 16.5 percent.[177] Again, this suggests that SBC's market share is well below the level necessary for market power.

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170. SBC has 39.6 percent of nationwide business lines, which suggests that its prorata share of the nationwide frame-relay revenues would be 6.0 percent (= 0.396 x 0.152) if each of the four RBOCs had the *same* in-region share. In fact, SBC has 4.4 percent of nationwide frame-relay revenues. Hence SBC's share of in-region revenues is likely to be less than 15.2 percent. This estimate of SBC's share of in-region frame-relay revenues is 11.1 percent (= 0.152 x 0.044 / 0.060).

171. IDC ATM STUDY, *supra* note 127, at Figure 6.

172. *Id.*

173. *Id.*

174. *Id.*

175. *Id.*

176. *Id.* IDC presents separate estimates for Qwest and U S WEST shares.

177. When one accounts for SBC's share of all business lines, our estimate of 14 percent proves to be slightly downwardly biased. SBC has 39.6 percent of nationwide business lines, which suggests that its prorata share of the nationwide ATM revenues would be 5.5 percent (= 0.396 x 0.14) if each of the four RBOCs had the *same* in-region share. In fact, SBC has 6.5 percent of nationwide ATM revenues. Hence SBC's share of in-region revenues is likely to be more than 14 percent. This estimate of SBC's share of in-region ATM revenues is 16.5 percent (= 0.14 x 0.065 / 0.055).

112. Not only are the RBOC market shares of packet switching low, but they do not appear to be gaining ground on the big three IXCs. For example, between 1999 and 2000, the RBOCs' share of the nationwide frame-relay revenues decreased from 16.2 percent to 15.2 percent;[178] their share of the nationwide ATM revenues increased from 9.9 percent to 14.0 percent.[179] Because the frame relay-market is roughly five times the size of the ATM market ($1.08 billion in ATM revenues across all carriers versus $6.32 billion in frame relay revenues across all carriers),[180] on a value-weighted basis, the RBOCs' share of the packet-switching market decreased from 15.4 percent in 1999 to 15.0 percent. Thus, we believe that one reasonable estimate of SBC's in-region market share for the packet-switching market is 15.0 percent. When we account for SBC's share of all business lines, our estimate of SBC's in-region share decreases to 12.0 percent.[181]

113. The estimated market shares presented above represent a reasonable proxy for SBC's in-region share of ATM and frame relay revenues. Extremely small market shares such as these are inconsistent with the notion of market power.

2. Demand Elasticities

114. For at least two reasons, we expect the demand for packet-switching services such as ATM and frame relay to be very price elastic. First, the major retail customers of packet-switched services are medium- to large-sized corporations, followed by government users, and educational institutions. According to IDC, corporate, educational, and government customers

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178. IDC FRAME RELAY STUDY, *supra* note 126, at 12-13.

179. IDC ATM STUDY, *supra* note 127, at Figure 6.

180. IDC FRAME RELAY STUDY, *supra* note 126, at Table 3; IDC ATM STUDY, *supra* note 127, at Table 3.

181. SBC has 39.6 percent of nationwide business lines, which suggests that its prorata share of nationwide packet-switching revenues would be 5.9 percent (= 0.396 x 0.15) if each of the four RBOCs had the *same* in-region share. In fact, SBC has 4.7 percent of nationwide packet-switching revenues. Hence SBC's

constitute about 96 percent of frame relay revenues,[182] and 82 percent of ATM revenues.[183] Another analyst has stated that "[f]rame relay has yet to make significant inroads in the small business market, and attempts to move the service down market could prove cost prohibitive for some small businesses."[184] As we mentioned earlier, the FCC has recognized that larger-business customers are more sophisticated and hence more likely to be price-sensitive.

115. Second, and related to the first reason, providers of packet-switching services are often chosen through a competitive-bidding process that results in long-term contracts. These long-term contracts insulate the customers from price increases. At the same time, providers are encouraged to commit resources to the provision of these services through the inclusion of early-termination clauses, which force the customer to pay a percentage of the present discounted value of payments upon early termination. As a result, it is very difficult for any given carrier to increase prices on existing customers, or, for that matter, to lure away customers from a rival before the end of a contract.

116. Because the consumers of packet-switching services are large and sophisticated, and because existing customers can guard against price increases through long-term contracts, the price elasticity of demand facing an individual supplier, such as SBC, is likely to be very high. Hence, SBC could not profitably raise the price for its advanced services offerings.

3. Supply Elasticities

117. There are several reasons to believe that the big three IXCs and other suppliers of packet-switched services could easily absorb any customers that would choose to leave SBC in

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share of in-region revenues is likely to be less than 15 percent. This estimate of SBC's share of in-region packet-switching revenues is 12.0 percent (= 0.15 x 0.047 / 0.059).

182. IDC FRAME RELAY STUDY, *supra* note 126, at Table 4.

183. IDC ATM STUDY, *supra* note 127, at Table 4.

response to any attempt to increase its prices. This is especially true given SBC's small share of the packet-switching market.

118. First, there are numerous providers of packet-switching services throughout SBC's region with vast packet-switching networks. As noted earlier, AT&T has a domestic network with over 620 Points of Presence (POP).[185] WorldCom and Sprint have similarly extensive networks.[186] At least 25 other CLECs also provide service in ten or more cities in SBC's region.[187] CLECs have deployed at least 325 packet switches in SBC's region, and they also have deployed extensive fiber networks to connect these packet switches.[188]

119. Second, competitors have rapidly been deploying new switches, proving that providers in this market can rapidly expand their capacity. For example, from 1997 to 2000 the number of competitive packet switches has grown by more than 115 percent, from 151 to more than 325.[189] Based on this evidence, it would be difficult to conclude that competitors face high barriers to entry in the provision of packet-switching services.

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184. Stratecast Partners, *ATM and Frame Relay Market Assessment*, Data/Internet Services Growth Strategies, Volume II, Number 10 (Sept. 2001).

185. AT&T Corp., High Speed Packet Services, AT&T Frame Relay and ATM Services, http://www.ipservices.att.com/brochures/atm.pdf.

186. Sprint Corp., Sprint Business, Dedicated Access, Service and Support http://www.sprintbiz.com/esolutions/dedicated_access/service.html. (320 POPs); IDC PACKET STUDY, *supra* note 152, at 59 (showing over 700 POPs for WorldCom); MCI WorldCom, Inc., US Products, Data Networking, Frame Relay http://www.worldcom.com/us/products/datanetworking/framerelay/index.phtml (showing 402 Frame Relay POPs).

187. NEW PARADIGM STUDY, *supra* note 158, at Ch. 13 (@link, Allegiance, Alltel, Birch Telecom, Choice One, Electric Lightwave, Focal Communications, Intermedia, IP Communications, Lightyear, McLeodUSA, Metromedia Fiber Networks, Mpower, New Edge Networks, NuVox, Pac West, Rhythms, TDS Metrocom, Teligent, Time Warner Telecom, TXU Communications, Telepacific, Winstar, XO)

188. *Id.*

189. *Id.* (2000 figures); NEW PARADIGM RESOURCES GROUP, CLEC REPORT 1999 (2000), at Ch. 10 (1999 figures).

120. Third, there is abundant supply—the *Wall Street Journal* reports a "glut"—of backbone capacity for high-speed networks.[190] Indeed, the cost of adding additional switches is small relative to the total outlays.[191] The only capacity limitation is the availability of copper or fiber facilities to access the local telecommunications network, which SBC is required to provide on a nondiscriminatory basis.

121. Because existing competitors profitably could absorb SBC's packet-switched traffic (its in-region share is roughly 15 percent), and because entrants can profitably build new capacity, we believe the supply elasticity for packet-switched services is likely to be high. Hence, supply elasticity is yet another factor that would undermine SBC's ability to exercise market power.

4. Cost Structure, Size, and Resources

122. SBC has no advantages over its competitors in the provision of larger-business advanced services. First, SBC's primary competitors in the market for packet-switched services are the big three IXCs. It is unreasonable to assume that SBC has greater resources than do AT&T, Sprint, and WorldCom. Other significant suppliers of packet-switching services include Intermedia (5 percent share of nationwide ATM revenues), Global One (4.1 percent), Broadwing (2.5 percent), Infonet (2.0 percent), and Concert (1.3 percent).[192]

123. Second, SBC has entered the larger-business advanced services market with a significant competitive disadvantage—the inability to provide packet-switching services on an interLATA basis in most of the states in which it operates. As one analyst has noted, "[t]hus far,

190. *Drowning in glass: The fibre-optic glut: Can you have too much of a good thing? The history of technology says not, but that was before the fibre-optic bubble*, THE ECONOMIST, Mar. 24, 2001 at *1; Gregory Zuckerman & Deborah Soloman, *Telecom Debt Debacle Could Lead to Losses of Historic Proportions*, WALL ST. J., May 11, 2001, at A1.

191. BATES & GREGORY, *supra* note 146, at 632.

the RBOCs have held a very small share of the frame relay market, primarily because they have only been allowed to offer intra-LATA services."[193] Indeed, competitors in the packet-switching services market routinely advertise their ability to provide both interLATA and intraLATA packet-switching services as giving them a great advantage over incumbent LECs like SBC. According to another analyst, "[b]ecause users can be exposed to a wide array of data access technologies, the ability to offer seamless, end-to-end service is becoming critical to winning new customers."[194]

124. Finally, none of these advanced services, to the extent SBC provides them, use legacy circuit-switching equipment. Rather, SBC has deployed new packet-switching equipment—including packet switches, and fiber optic cable to connect them—to provide these new services. SBC has therefore entered the packet-switched services market with no advantages stemming from its provision of local exchange, exchange access, or other circuit-switched services.

C. SBC Could Not Leverage Market Power from Telephone Exchange or Exchange Access Services into the Larger-Business Advanced Services Market

125. As demonstrated above, despite the fact that SBC is vertically-integrated into the local exchange market, it has not acquired a significant share of the larger-business advanced services market. Hence, even if SBC had market power in the provision of local exchange services, it has no ability to leverage that power to acquire dominance in the provision of advanced services to larger businesses.

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192. IDC ATM STUDY, *supra* note 129, at Figure 6.
193. *Id.* at 12.
194. *New Demands for Capacity Increase Competition Among Packet Data Providers,* PR NEWSWIRE, Oct. 4, 1999 (quoting Isabelle Gallo, analyst at Frost & Sullivan).

126. The likelihood that SBC would engage in such behavior is remote. First, SBC's competitors often do not rely on SBC's local facilities at all to provide packet-switching services, but instead use their own local access facilities. In particular, AT&T and WorldCom use their own high-speed connections in the last mile to provide advanced services to larger businesses.[195] Moreover, even where competitors do seek access to SBC's facilities, they may acquire them on a nondiscriminatory basis.[196]

127. Likewise, SBC could not engage in a strategy of predatory pricing through cross-subsidization of its advanced services. As noted above, SBC's local exchange operations are subject to rigorous price regulation—hence, there are no supracompetitive rents from which SBC could finance a cross-subsidy.

CONCLUSION

128. There is no economic justification for regulating SBC's mass-market broadband services or its larger-business advanced services. Mandatory tariffing is unnecessary to protect DSL customers from unreasonable prices or lack of choice content, because competition from cable operators and other broadband access providers compel SBC to maximize consumer choice and to price its service at competitive levels. SBC lacks market power in the mass-market broadband services market and is therefore non-dominant. Similarly, mandatory tariffing is unnecessary to protect ATM or frame-relay customers from unreasonable prices, because SBC has such a small share of the market and because SBC is constrained to compete effectively by

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195. NEW PARADIGM STUDY, *supra* note 158, at Ch. 13 (AT&T at 3-4, WorldCom at 4-7).

196. *See, e.g.*, Applications of Pacific Telesis Group and SBC Communications, Inc., for Consent to Transfer Control of Pacific Telesis Group, Rpt. No. LB-96-32, 12 F.C.C. Rcd. 2624, 2648 ¶ 53 (1997) ("Price discrimination . . . is relatively easy for [the Commission] and others to detect," and is "therefore unlikely to occur.").

regulation that restricts interLATA data transmission. SBC also lacks market power in the larger-business advanced services market and is therefore non-dominant. The Commission would advance the public interest by forbearing from further regulation of SBC's advanced services and facilities.

APPENDIX: OUTPUT FOR NESTED-LOGIT MODEL

129. We estimate a consumer's probability of choosing a type of Internet access using a two-stage nested logit model. The four end choices are no Internet, dial-up Internet service, cable modem, or direct-service line. In the first stage of the nested logit, the consumer chooses whether to have no Internet access, narrowband access, or broadband access. No Internet access is the base category relative to which the other two branches are estimated. The independent variables that determine the first-stage choice are education dummies, income dummies, and age. If the consumer chooses broadband access, the consumer then chooses in the second stage between DSL and cable modem. The independent variable that determines the second choice is price.

130. We use TNS Telecoms survey data from the fourth quarter of 2000 and the first quarter of 2001. We restrict our sample to consumers who have access to both DSL and cable modem service—7,561 of 62,846 observations had access to both DSL and cable modem service at the time of the survey. We also exclude from the sample observations with survey weights equal to zero.

131. We calculate price information for Internet service using the bill-harvesting portion of the sample, a survey in which only a fraction of the sample participates. Even for consumers who are in the bill-harvesting sample, the price of Internet service is available only for the chosen alternative for each consumer. We impute missing data for dial-up prices using geographic matching within the sample. We impute missing data for DSL and cable modem service using the typical price charged by the RBOC (for DSL) and incumbent cable provider (for cable modem service) in the geographic area where the consumer is located. These prices were obtained from the companies' web sites and news reports about price changes. The average

price for dial-up was $19.25, for cable modem $41.80, and for DSL $43.08 in the sample for the fourth quarter of 2000 and first quarter of 2001.

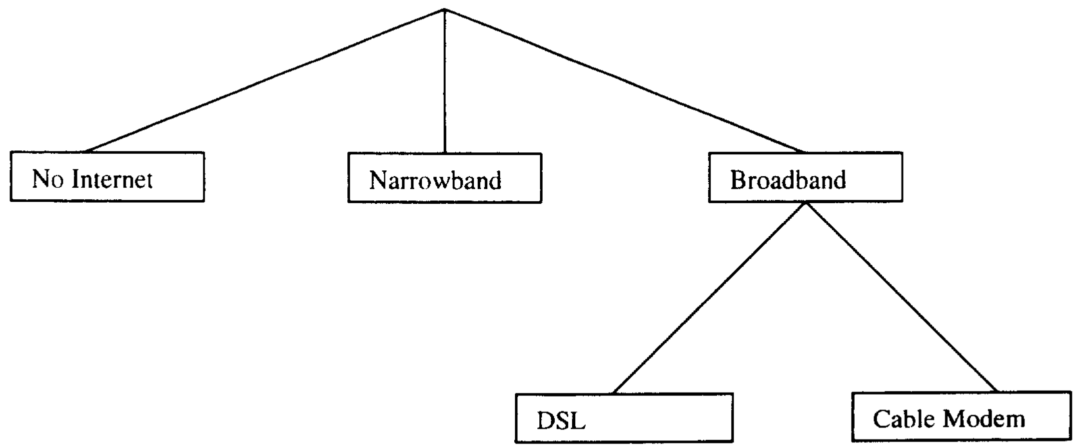
132. Table A1 presents the means of the independent variables used in the first stage of the nested logit model. In certain cases, the higher categories of the income and education variables were dropped, because they were not identified.

TABLE A1: EXPLANATORY VARIABLES IN THE NESTED LOGIT MODEL

Variable	**Mean**	**Standard Error**
Income less than $15,000	0.0746	0.26
Income between $15,000 and $25,000	0.0946	0.29
Income between $25,000 and $35,000	0.1230	0.33
Education less than high school	0.0497	0.22
High school education	0.2404	0.43
Some college education	0.2626	0.44
Age	40.0000	11.58

We used the nested logit routine in the LIMDEP (Version 7) program to estimate the nested logit model and calculate the own-price and cross-price elasticities of demand for Internet access choices. LIMDEP requires the user to specify the tree structure for the model as well as the utility functions for each alternative at each stage. The nested logit routine can then formulate the likelihood function and estimate the nested logit model using maximum likelihood. Figure A1 shows the tree structure, and is followed by the utility functions that we specified. Table A2 presents the coefficient estimates.

FIGURE A1: TREE STRUCTURE FOR THE NESTED LOGIT MODEL



The utility functions for the Nested Logit Model were as follows:

[1] U (DSL)=dsl+*beta**price

[2] U (Cable)=cable+*beta**price

[3] U (Dial-up)=dialup+*beta**price

[4] U (No Internet)=*beta**price

[5] U (Broadband)= *ibroad1**income1+*ibroad2**income2+*ibroad3**income3+ *ebroad1**educ1+*ebroad2**educ2+*ebroad3**educ3+*abroad**age

[6] U (Narrowband)=*inarrow1**income1+*inarrow2**income2+*inarrow3**income3+ *enarrow1**educ1+*enarrow2**educ2+*enarrow3**educ3+*anarrow**age

Table A2 presents the coefficient estimates from the nested logit model.

TABLE A2: ESTIMATED COEFFICIENTS FROM THE NESTED LOGIT MODEL

P (Y = BROADBAND)

Variable	Coefficient	Standard Error	T-Statistic	P-Value
Income less than $15,000	-1.4977	0.1680	-8.9170	0.0000
Income between $15,000 and $25,000	-1.1317	0.1443	-7.8440	0.0000
Income between $25,000 and $35,000	-0.9080	0.1265	-7.1790	0.0000
Education less than high school	-1.3247	0.2067	-6.4100	0.0000
High school education	-1.0906	0.1074	-10.1500	0.0000
Some college education	-0.3665	0.0995	-3.6830	0.0002
Age	-0.0245	0.0036	-6.7910	0.0000

P (Y = NARROWBAND)

Variable	Coefficient	Standard Error	T-Statistic	P-Value
Income less than $15,000	-1.3159	0.1021	-12.8870	0.0000
Income between $15,000 and $25,000	-0.7672	0.0914	-8.3930	0.0000
Income between $25,000 and $35,000	-0.6039	0.0859	-7.0260	0.0000
Education less than high school	-0.7729	0.1255	-6.1600	0.0000
High school education	-0.5869	0.0751	-7.8170	0.0000
Some college education	-0.1504	0.0784	-1.9170	0.0552
Age	-0.0197	0.0025	-7.7950	0.0000

P (TYPE OF INTERNET ACCESS)

Variable	Coefficient	Standard Error	T-Statistic	P-Value
Price	-0.0284	0.0069	-4.1140	0.0000
DSL	0.0972	0.2996	0.3240	0.7456
Cable modem	0.4374	0.2899	1.5090	0.1314
Dialup	1.7474	0.1358	12.8700	0.0000

The estimates indicate that income below $35,000 and lack of a college degree significantly decreases a consumer's propensity to choose a broadband access technology. Households that are headed by an older person are less likely to choose a broadband access technology. Finally, increases in the price of the Internet access technology—regardless of the type—significantly decreases the consumer's propensity to choose that access technology.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Robert W. Crandall
October 1, 2001

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

J. Gregory Sidak
October 1, 2001